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# RTX-IR

**(RTX400-IR, RTX400H-IR, RTX600-IR, RTX600H-IR & RTX800-IR)**

## iSCSI Gigabit Ethernet to SATA II External RAID System

# User's Manual

**Revised July 29, 2008**

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# Introduction

**About this Manual**
Thank you for choosing WiebeTech products. If you have any questions, please e-mail support@wiebetech.com or call our tech support.

This manual is designed and written for users of the RTX-IR. Users should ideally be familiar and have some experience with RAID planning and data storage operations. However, this manual will provide instructions and education for those who have little experience in RAID to install and setup the RTX-IR.

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# Chapter 1: Introduction to RAID

A RAID (Redundant Array of Independent Disks) is an array of multiple hard drives that are combined in a way that provides faster performance and/or data safety. Your RTX unit is capable of creating and managing several different varieties of RAID. You may choose your preferred RAID level based on factors such as disk capacity, desired data safety, and desired performance.

## Summary of RAID Levels

The RTX supports RAID Levels 0, 1, (0+1), 3, 5 and 6. RAID level 5 is most commonly used by those seeking an optimal balance of speed and data safety.

**RAID Features and Performance**

| RAID Level | Description | Min. Drives | Max. Drives | Data Reliability | Data Transfer Rate |
|---|---|---|---|---|---|
| **0** | Also known as striping. Data distributed across multiple drives in the array. *There is no data protection.* | 1 | 8 | No data Protection | Very high |
| **1** | Also known as mirroring. All data replicated on separated disks. RAID 1 is almost always 2 disks. This is a high availability solution, but due to the 100% duplication, it is also a costly solution. | 2 | 2 | Lower than RAID 6; Higher than RAID 3, 5 | Reads are higher than a single disk; Writes are similar to a single disk |
| **0+1** | Also known as Block-Interleaved Parity. Data and parity information is subdivided and distributed across all disks. Parity must be equal to the smallest disk capacity in the array. Parity information normally stored on a dedicated parity disk. | 3 | 8 | Lower than RAID 6; Higher than RAID 3, 5 | Transfer rates are more like RAID 1 than RAID 0 |
| **3** | Also known as Bit-Interleaved Parity. Data and parity information is subdivided and distributed across all disks. Parity must be equal to the smallest disk capacity in the array. Parity information normally stored on a dedicated parity disk. | 3 | 8 | Lower than RAID 1, 10, 6; Higher than a single drive | Reads are similar to RAID 0; Writes are slower than a single disk |
| **5** | Also known as Block-Interleaved Distributed Parity. Data and parity information is subdivided and distributed across all disks. Can withstand the failure of one drive, and 80& of drive capacity is usable. | 3 | 8 | Lower than RAID 1, 10, 6; Higher than a single drive | Reads are similar to RAID 0; Writes are slightly slower than RAID 0 |
| **6** | Two different parity bits are used, to create double redundancy. Can withstand the failure of two drives, but only 60% of drive capacity is usable. | 4 | 8 | Higher than 1,10, 5 | Slightly less than RAID 5 |

# Chapter 2: Introduction to iSCSI

## 2.1 What is iSCSI?

iSCSI is a technology that allows a data storage device to be accessed over a TCP/IP network using SCSI protocols. When your computer's OS receives a request for data access, it generates a SCSI command and then sends an IP packet across a network or direct ethernet connection. A software utility known as an iSCSI Initiator is used to generate the SCSI commands. Such a utility must be installed on the computer before it can access an iSCSI storage device.

## 2.2 What is the benefit of iSCSI?

An iSCSI storage device can be placed anywhere throughout a network, so the device can reside at a great distance from the computer which accesses it. It is also a very fast connection when used on a gigabit network, achieving speeds of 100MB/sec or more. The connection it uses (RJ45 – standard ethernet port) is commonly found on desktop and laptop computers, so there is no need to purchase potentially expensive host bus adapters to provide a connection.

## 2.3 What is iSCSI not?

iSCSI storage devices are not Network Attached Storage (NAS) devices. They have no built-in server capabilities and therefore cannot be accessed by more than one computer at a time. Multiple computers can only access the data if the iSCSI device is first attached to a single computer which is then set up as a server.

# Chapter 3: Pre-Installation

## 3.1 Install iSCSI Initiator software on your computer.

This is a required step. Any computer must have Initiator software installed before it can connect to an iSCSI device such as the RTX-IR. Both freeware and commercial software utilities are available for this purpose. Note: Initiator software is not required for additional computers that share files with the host computer attached to the RTX. In such a scenario, the host computer acts as a server to the other computers. Only the computer directly accessing the RTX needs Initiator software.

**Windows**
Users can download free Microsoft iSCSI initiator software at the following URL:
http://www.microsoft.com/downloads/details.aspx?FamilyID=12cb3c1a-15d6-4585-b385-befd1319f825&DisplayLang=en

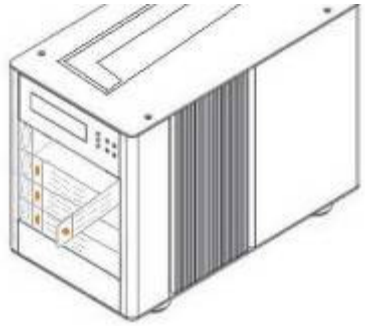
**Mac OS X**
Studio Network Solutions makes a freeware iSCSI Initiator for Mac OS 10.4, available here:
http://www.studionetworksolutions.com/products/product_detail.php?pi=11

ATTO Technologies also makes a commercial iSCSI Initiator for Mac: http://www.attotech.com/xtend.html

**Linux**
Linux also provides iSCSI initiator software for users to download. Refer to the URL below:
Instructions web page: http://linux-iscsi.sourceforge.net/
Download link: http://sourceforge.net/project/showfiles.php?group_id=26396
Instructions document: http://www.cuddletech.com/articles/iscsi/iscsiref.pdf

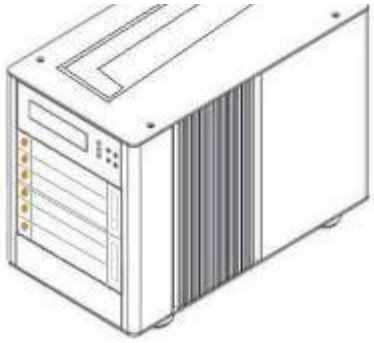
## 3.2 Check the accessories with your RTX-IR.

Please contact WiebeTech if any parts are missing or damaged. The box should contain the following items:



**RTX400-IR, RTX400H-IR & RTX600H-IR**

| Accessories | Quantity |
|---|---|
| Ethernet Cables | 2 |
| RS-232 Configuration Cable | 1 |
| Power Cable | 1 |
| Packet of Keys | 1 |
| Manual and Warranty Info | (on CD) |

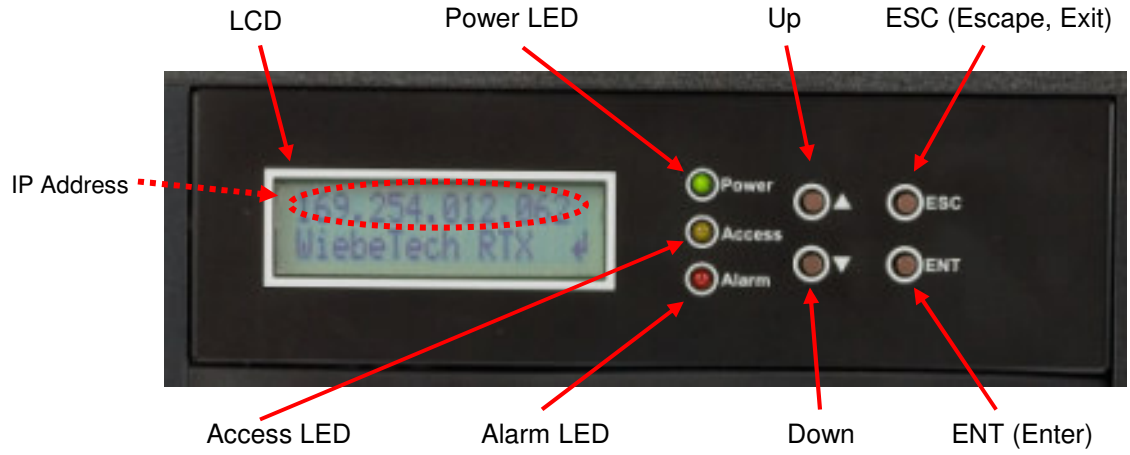


**RTX600-IR & RTX800-IR**

| Accessories | Quantity |
|---|---|
| Ethernet Cables | 2 |
| RS-232 Configuration Cable | 1 |
| Power Cable | 1 |
| Manual and Warranty Info | (on CD) |

## 3.3 Take a moment to familiarize yourself with the parts of your new product.

**LCD Panel on front of RTX**

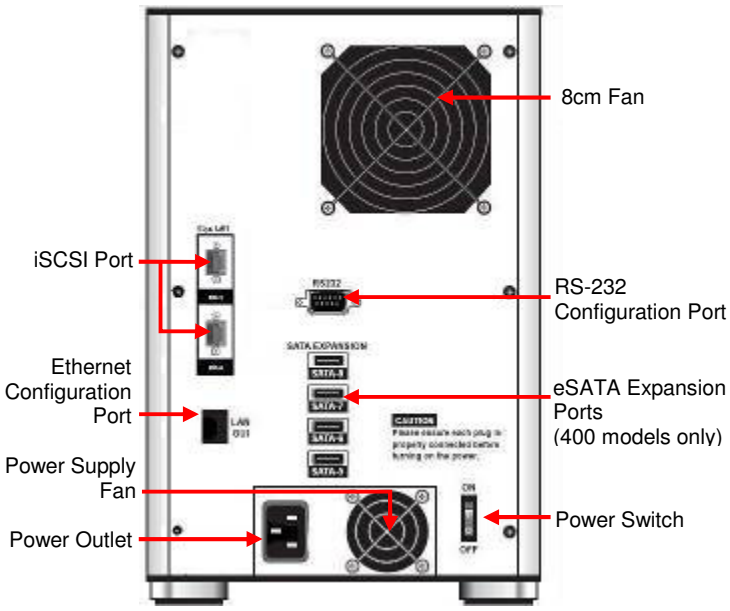



**Hardened Bay**

**Standard Bay**

**Basic Bay**

**Back Panel**



WARNING: Do not block the ventilation fan during operation. Overheating may damage the device or hard drives.

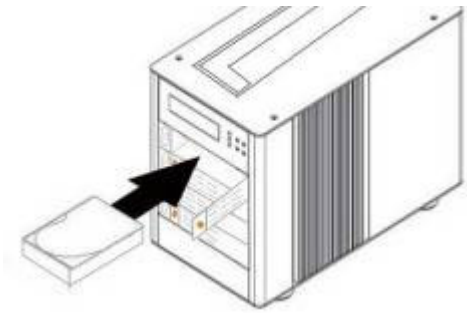
All RTX TrayFree Bays accept 1TB SATA drives, have power and access LEDs, and connect to the host via a SATA

| TrayFree Bay | All Metal | Lockable | Shock Absorbing | TrayFree |
|---|---|---|---|---|
| Basic Bay | | | | ✓ |
| Standard Bay | | ✓ | ✓ | ✓ |
| Hardened Bay | ✓ | ✓ | ✓ | ✓ |

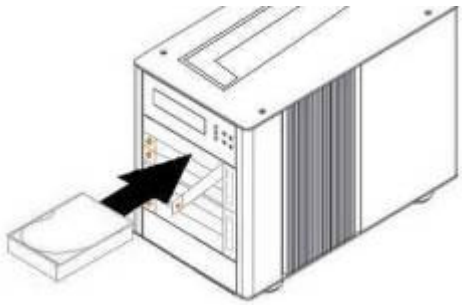
# Chapter 4: Hard Drive Installation

If you purchased your RTX with pre-configured drives, you may skip to the next section.

**Install a SATA (Serial-ATA) hard drive into each bay.** With TrayFree™ technology, this process couldn't be easier! Simply pull the ejection handle to open the bay door, slide in your SATA drive, and shut the door behind it. The drive is inserted with the label up and the SATA connection on the drive inserted first. With the RTX400 & RTX600H, you can lock the bay for additional security, but make sure to unlock it before pulling on the ejection handle again.



RTX400



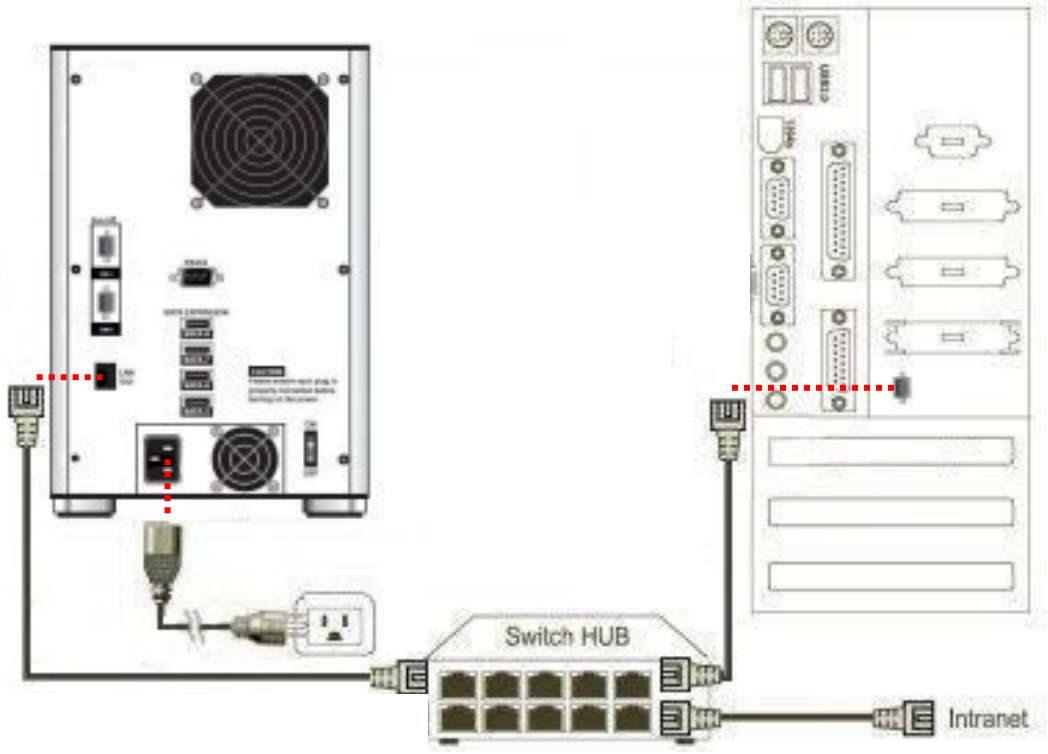
RTX600

NOTE: If any of the drives are inaccessible after powering on the unit, try the following steps:
1. Turn off the power.
2. Remove the drive(s) in question.
3. Reinsert the drive(s).
4. Turn on the power.

# Chapter 5: Configuration

## 5.1 Connect the RTX to your network (or computer) for configuration.

**a.** Plug an ethernet cable into the "LAN GUI" port on the rear of the RTX.
**b.** Connect the other end of the ethernet cable to your network. Usually, this means plugging it into a router or hub. In an office environment, you may have a network jack built into your office wall. If a network connection is not available, you can connect the ethernet cable directly to an RJ45 (ethernet) port on your computer.
**c.** Connect the power cable to the rear of the RTX and to a grounded electrical outlet.
**d.** Turn on the RTX unit's power using the switch on the rear panel.




## 5.2 Use the LCD to configure the LAN GUI port

RTX has both an LCD interface and a GUI. The LCD interface has only basic functionality and is mainly used to configure the IP address of the LAN GUI port. Once the LAN GUI has been configured, the GUI can be used to fully configure the RTX.

### 5.2.1 Navigating the LCD menu

Use the four function keys, ▲ (Up), ▼ (Down), **ESC** (Escape) and **ENT** (Enter) to manipulate the LCD interface.

After pressing **ENT** (Enter) key, you can use the ▲ (Up) and ▼ (Down) keys to select a function. If there is an alarm or error message, the LCD will display the related information.

### 5.2.2 LCD functions:

| | |
|---|---|
| **Alarm Mute** | To turn off the alarm sound when an error occurs |
| **Reset/Shutdown** | To reset or shutdown the controller |
| **Quick Install** | To use "Quick Install" to set up a volume by three steps. Please refer to section 4.3 for configure via the web-based GUI |
| **View IP Setting** | To view current IP address, subnet mask and gateway |
| **Change IP Config** | To set up the IP address, subnet mask and gateway. You can choose to use DHCP server (for IP address allocation) or manually specify the IP address |
| **Reset to Default** | To restore factory defaults:<br>Default Password: **1234**<br>Default IP address: **192.168.0.1**<br>Default subnet mask: **255.255.255.0**<br>Default gateway: **192.168.0.254** |

### 5.2.3 RTX-IR LCD Menu Diagram

Use the following chart for reference when following the instructions in 5.2.4 through 5.2.7 for setting up the RTX according to your network type.

| Main Menu | 2nd Menu Screen | 3rd Menu Screen | 4th Menu Screen | 5th Menu Screen |
|---|---|---|---|---|
| WiebeTech RTX | [Alarm Mute] | [ENT:OK<br>ESC: Back] | | |
| | [Reset/Shutdown] | [Reset] | [ENT:OK<br>ESC: Back] | |
| | | [Shutdown] | [ENT:OK<br>ESC: Back] | |
| | [Quick Install] | RAID 0<br>(RAID 1/RAID 3/<br>RAID 5/RAID 6)<br>xxxxxx MB | Volume Size<br>(xxxxxx M) | Adjust Volume Size |
| | | | Apply The Config | [ENT:OK<br>ESC: Back] |
| | [View iSCSI IP] | [CH1 Static]<br>[192.168.1.1] | | |
| | | [CH2 Static]<br>[192.168.2.1] | | |
| | | [IP Subnet Mask]<br>[255.255.255.0] | | |
| | | [IP Gateway]<br>[192.168.000.254] | | |
| | [Change IP Config] | [DHCP] | [ENT:OK<br>ESC: Back] | |
| | | [Static IP] | [IP Address] | Adjust IP address |
| | | | [IP Subnet Mask] | Adjust Submask IP |
| | | | [IP Gateway] | Adjust Gateway IP |
| | | | [Apply IP Setting] | [ENT:OK<br>ESC: Back] |
| | [Reset to Default] | [ENT:OK<br>ESC: Back] | | |

### 5.2.4 If you are connected to a DHCP-enabled network

On DHCP networks, a new IP address is dynamically assigned to the RTX's LAN GUI port as soon as the network detects it. You can determine this address by checking the LCD interface on the front of the RTX. It will appear in this format: xxx.xxx.xxx.xxx. Simply type this IP address into a web browser on your computer. This will access the RTX's GUI, which you will use to configure the unit.

### 5.2.5 If you are connected to a static network

**a.** Check your computer's IP address. To do this in Windows, open Network Connections in the Control Panel. Double-click on your network and then click on the Support tab. Your computer's IP address will be displayed. Mac users can find this information in System Preferences → Network.
**b.** On the RTX's LCD interface, press ENT and then scroll up or down to **Change IP Setting**. Press ENT.
**c.** Scroll up or down to find **Static**. Press ENT.
**d.** Change the IP address to closely match what your computer is using. For example, if your computer's IP address is 192.168.000.009 you could change the RTX's IP to 192.168.000.007. Everything but the last set of three digits must be the same! When changing the IP address you'll notice that a box flashes over the digit to be changed. While the digit is selected, press up or down to change it. Press ENT to move to the next digit. After the IP is set, press ENT all the way to the end and confirm the settings change. To confirm, press up for "yes" and then press ENT again.
**e.** Type the RTX's new IP address into a web browser on your computer. This will access the RTX's GUI, which you will use to configure the unit.

**Not sure what type of network you have?** If the IP address displayed on the LCD starts with 169.254 or 192.168, this indicates that the network is probably not DHCP-enabled. Use the instructions for a static network.

### 5.2.6 If you are connected directly to a computer

The instructions are similar to those for a static network (see 5.2.2), except that your computer will not have IP address assigned if it's not a part of a network. Since the RTX and your computer must have similar IP addresses, you will assign an IP address to your computer based on the default IP address of the RTX.
**a.** Check the RTX's LCD to find out the IP address of the LAN GUI configuration port. It will appear in this format: xxx.xxx.xxx.xxx.
**b.** Next, change your computer's IP address so that all but the last three digits match the RTX's address. For example, if the RTX's IP is 169.254.12.62, you might assign your computer the number 169.254.12.63 (assuming no other computer on the network is already using that number). The process of changing your computer's IP address varies depending on its operating system. (For Windows XP, open Network Connections in the Control Panel. Right-click on your network and select Properties. On the new window that opens, select TCP/IP and click the Properties button. Mac users can go to System Preferences → Network.) By default, your computer is probably set to receive a new IP address automatically. Change the setting to manual configuration and then type in the IP address.
**c.** Using the same process as the previous step, change the computer's Mask setting to match the RTX's Mask setting.
**d.** Finally, use the RTX's LCD interface to change the RTX's Gateway setting. It should match the IP address you assigned to your computer.
**e.** Launch a web browser and type the RTX's IP address into the URL bar, as if it were a website. This will access the RTX's GUI, which you will use to configure the unit.

The tables below show example settings. The table on the left shows the type of settings that will appear by default. The table on the right shows how the settings might look after you've made changes.

| | RTX | Computer |
|---|---|---|
| **IP Address** | 169.254.12.62 | (blank) |
| **Mask** | 255.255.000.000 | (blank) |
| **Gateway** | 000.000.000.000 | (blank) |

*Before making changes*

| | RTX | Computer |
|---|---|---|
| **IP Address** | 169.254.12.62 | 169.254.12.63 |
| **Mask** | 255.255.000.000 | 255.255.000.000 |
| **Gateway** | 169.254.12.63 | (blank) |

*After making changes*

### 5.2.7 If you are connecting from home to office

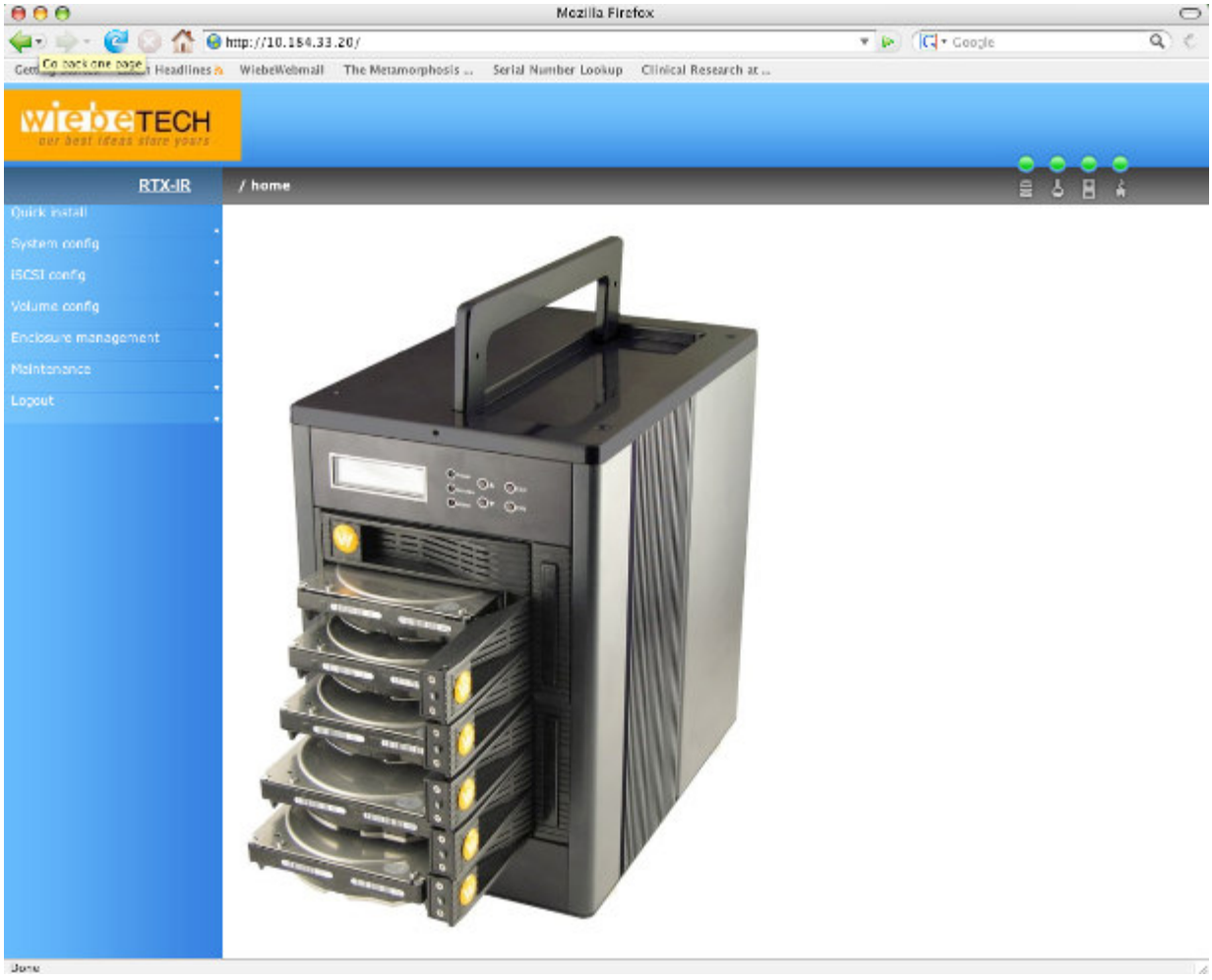
RTX-IR can also be used over the internet. If you are connecting to an RTX-IR at your office from home, you will need to contact your IT administrator to set up a VPN client to log in to the office network. Once you have logged in to the office network, you can access the RTX-IR just as if you were actually at your office (see section 5.2.4 or 5.2.5, depending on how your office network is configured).

### 5.2.8 If you are connecting from office to home

Most home networks are configured with a router to allow multiple computers to share an internet connection. In this case, you will need to set up your router to forward port 3260 to the RTX-IR. This process varies depending on the router you are using, so consult your router's user documentation or contact the manufacturer if you have difficulties. The iSCSI initiator should be set to contact the public IP address of your cable modem.

# Chapter 6: Using the GUI

You will use the web browser-based GUI to set up a RAID and create logical volumes on the RTX. After accessing the GUI (see step 5.2), the GUI's main page should load, displaying a picture of the RTX with several options to the left. When you click on any option, you will be prompted for a user name and password. The user name is "**admin**" and the default password is "**1234**."



## 6.1 GUI indicators

The top right hand corner of the GUI window displays several indicators.

**RAID light:** Green indicates the RAID is working properly. Red indicates a RAID error. If no RAID is set up, the light will remain green.

**Temperature light**: Green indicates normal. Red indicates abnormal system temperature, such as overheating.

**Voltage light:** Green indicates normal. Red indicates abnormal voltage status, such as a power surge or a bad power supply.

## 6.2 Overview of GUI architecture

- Quick Install
- System Config
  - System name
  - IP address
  - Language
  - Login config
  - Password
  - Date
  - Mail
  - SNMP
  - System Log Server
  - Event Log
- iSCSI Config
  - Entity Property
  - NIC
  - Node
  - Session
  - CHAP account
- Volume Config
  - Physical Disk
  - Volume Group
  - User Data Volume
  - Cache Volume
  - Logical Unit
- Enclosure Management
  - SES config
  - Hardware monitor
  - SMART
- Maintenance
  - Upgrade

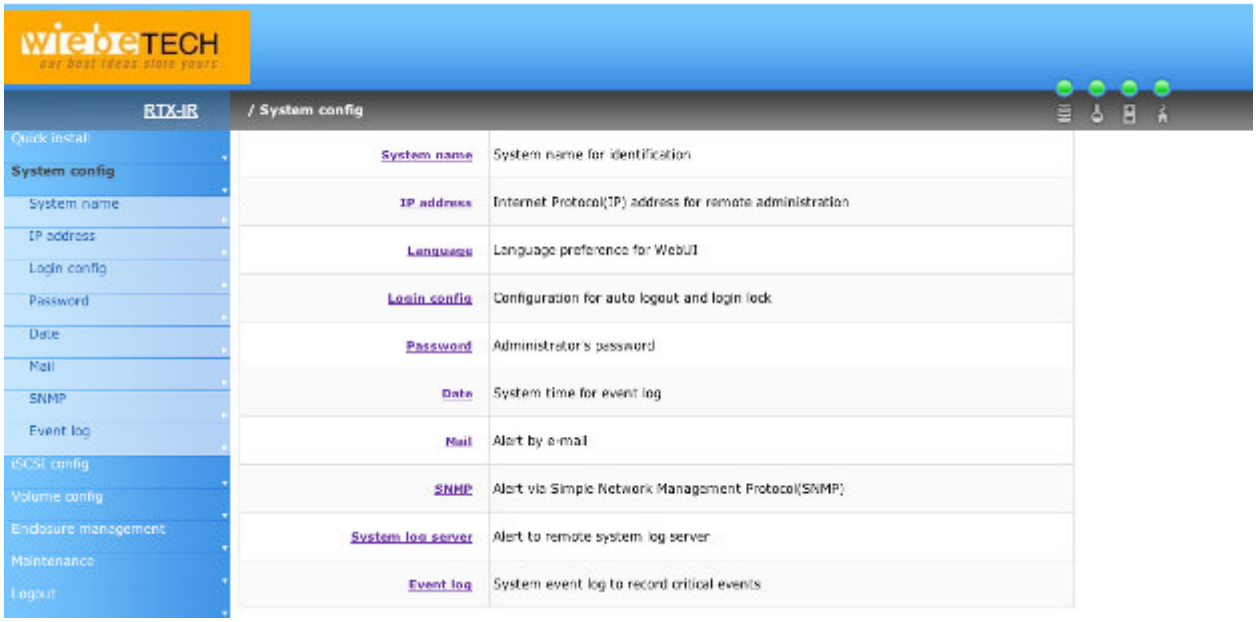
  - Info
  - Reset to default
  - Config import & export
  - Shutdown
- Logout

## 6.3 Quick Install

WiebeTech does not recommend using the Quick Install option to set up your RTX-IR. For quick set-up of a RAID, refer to section 6.9.

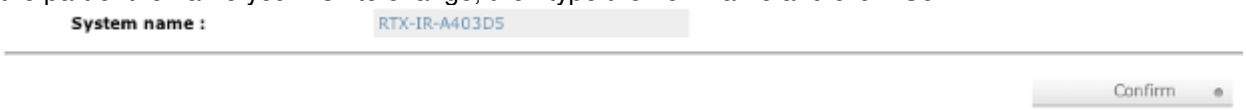
## 6.4 System Config

The System Config menu gives access to a number of options used to configure the RTX-IR system properties. Click on "System Config" to access the following menu options: System name, IP address, Language, Login config, Password, Date, Mail, SNMP, System Log Server, and Event Log.



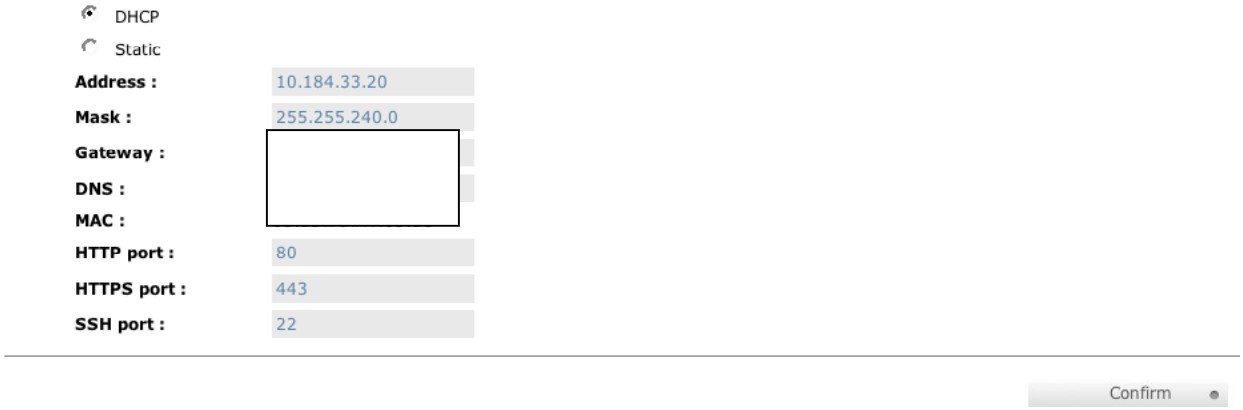

### 6.4.1 System name

Clicking on the "System name" option allows you to view and change the system name. The default system name is "RTX-IR-<individual serial number>" Note: This serial number is different from the one on the outside of the product, and is not the one that should be used to contact technical support.
To change the system name, simply click in the box displaying the system name and highlight or delete the part of the name you wish to change, then type the new name and click "Confirm."




### 6.4.2 IP address

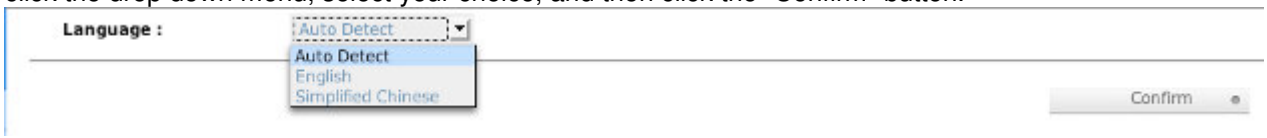
The IP address option allows you to view and modify the IP information of the LAN GUI port of the RTX-IR. Note that this is not the option used to configure the IP address of the data ports.




*An RTX-IR configured for DHCP. Some of the information has been obscured for security reasons.*

### 6.4.3 Language

The Language option allows you to change the language of the GUI menu. To change the language, click the drop down menu, select your choice, and then click the "Confirm" button.




### 6.4.4 Login Config

The login configuration features are "Auto Logout" and "Login Lock." Auto Logout allows you to set a time of 5 minutes, 30 minutes, or 1 hour to automatically log the user out of the GUI. Login Lock prevents multiple users from using the GUI simultaneously. Both features are disabled by default.

To enable a feature, click on the dropdown menu associated, select the new option, and then click the confirm button.

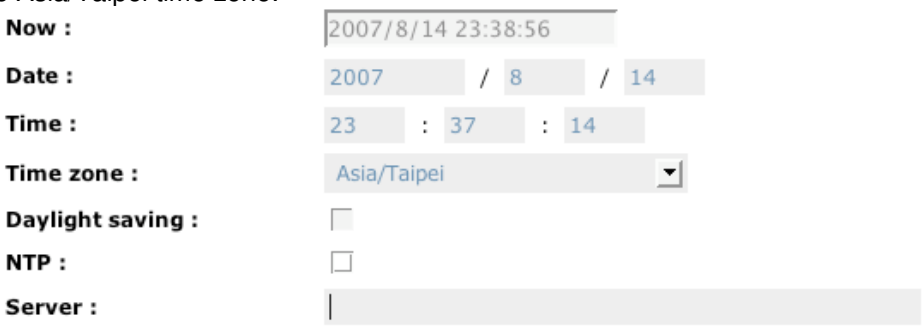
### 6.4.5 Password

The Password option allows you to change the administrative password used to access the GUI. (Recall that the default user name and password is admin/1234.) To change the password, enter the old password in the first field, then type the new password in the second and third field and click the "Confirm" button on the right side of the screen.

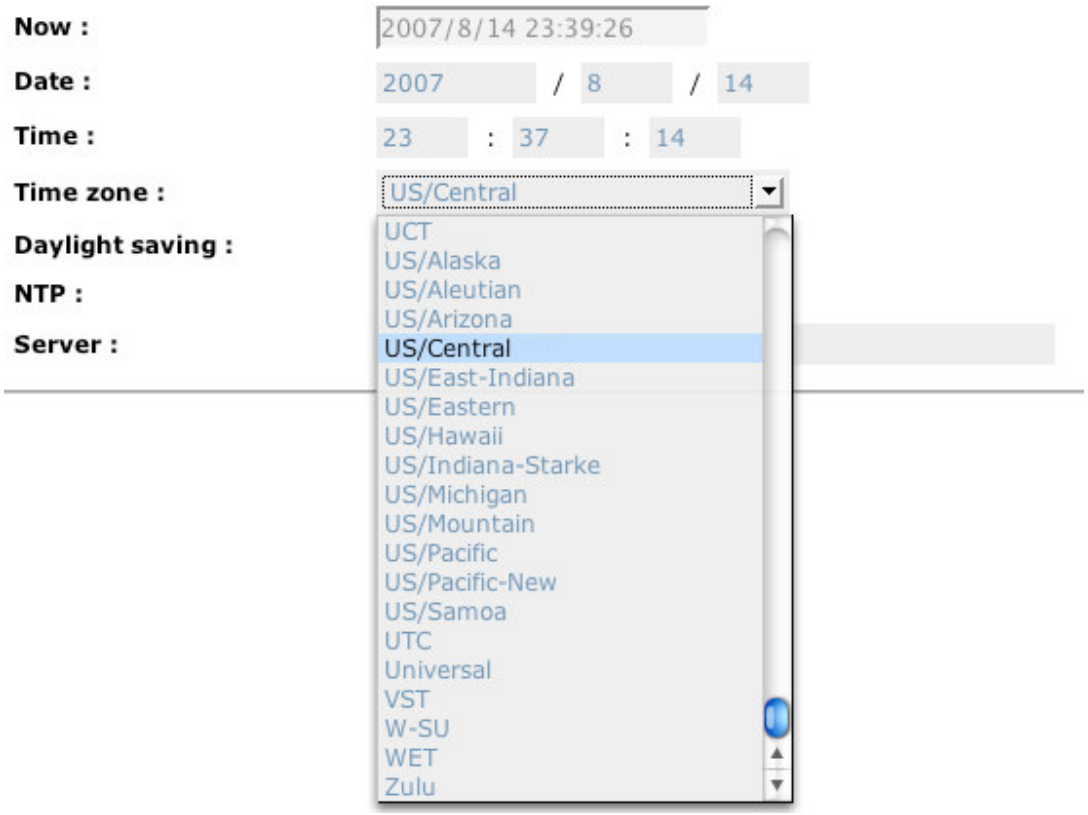
A dialog box will appear asking for verification. Click "OK." After the password has been changed, another dialog box will appear to inform you that the password has been changed.

### 6.4.6 Date

The Date option allows you to change the date and time settings of the RTX-IR. The default settings are the Asia/Taipei time zone:



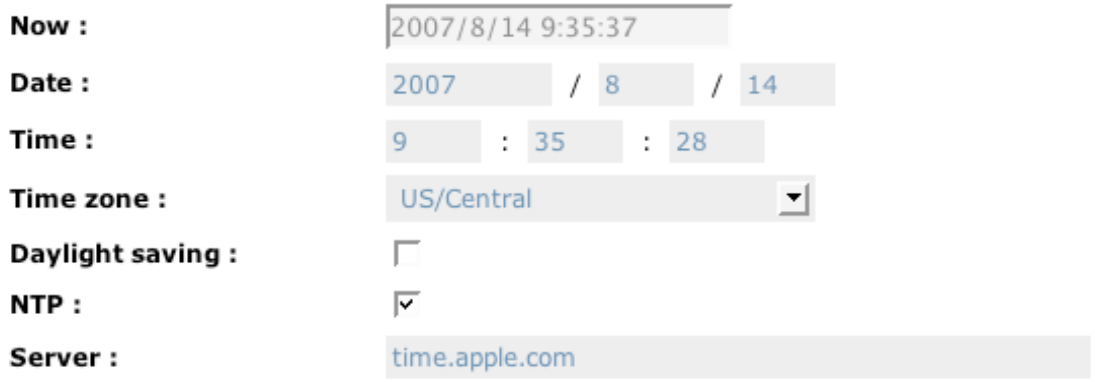

To change the date or time, click in the field that you wish to change and highlight or delete the information, then type the new information and click confirm. To change the time zone, click the drop down box and then scroll up or down until you reach the correct time zone, then choose that time zone and click confirm.




After confirming, a dialog box will appear verifying that changes have been made.

Alternatively, an NTP (network time provider) can be used to sync the RTX-IR's time information with that of a standardized server. To use an NTP, click the NTP check box, then input the server information in the server field.

Click confirm to update the time settings. A dialog box will appear to inform you that the changes have been made. The updated settings will reflect the time settings of the NTP:




### 6.4.7 Mail

RTX-IR can be configured to send email to up to 3 addresses when events, warnings, and errors occur. Contact your IT administrator to set up an email address for RTX-IR and to input the proper SMTP settings.

### 6.4.8 Simple Network Management Protocol (SMNP)

SNMP can be configured to send trap messages to up to three different addresses on the network. To add an address, simply enter the IP address of the receiving server or computer, then click confirm. Note: The receiving server must be configured to receive SMNP messages.

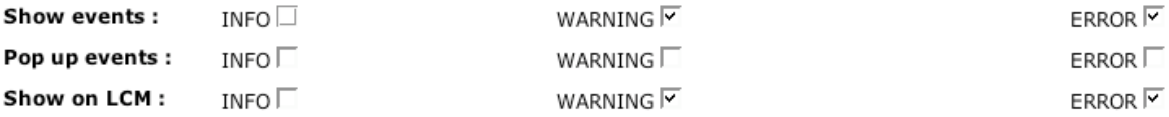
For more information on SMNP, you may wish to consult the third party website: http://www.tech-faq.com/snmp.shtml

### 6.4.9 System Log Server

The System Log Server option allows configuration for error, warning, and information reporting via a certain port on the server. Enter the server IP in the first line and the port used in the second line (default 514). The facility can be changed between User and Local1 through Local7 using the dropdown box. Select the check boxes for Info, Error, and Warning that pertain to the information that you want to be reported.

### 6.4.10 Event Log

The Event Log allows you to display and download event messages. To configure what type of messages are displayed, click the Filter button. By default, errors and warnings will be displayed on both the LCD of the unit itself and in the GUI.




Use the checkboxes to configure how the information is displayed.

Click the Download button to download the entire event log as a text file. Click the Clear button to clear the entire event log. Click the Mute button to stop system alerts.

## 6.5 iSCSI config

The iSCSI config menu options are generally used to modify the connection properties of the RTX-IR. Click on “iSCSI Config” to access the following menu options: Entity Property, NIC, Node, Session, CHAP account.

### 6.5.1 Entity property

The Entity Property option allows you to add an Internet Storage Name Service (iSNS) server IP address to the iSNS server group to which the iSCSI initiator can send queries. Simply enter the iSNS IP address in the iSNS IP field and click Confirm. Note: Setting an iSNS is not necessary to use the RTX-IR.

### 6.5.2 NIC

Click on NIC to modify the IP settings of the two gigabit Ethernet data ports. You will see the following information:

| Name | DHCP | IP address | Netmask | Gateway | MTU | MAC address | Link |
|---|---|---|---|---|---|---|---|
| LAN1 | yes | 10.184.33.35 | 255.255.240.0 | | 1500 | | down |
| LAN2 | yes | 10.184.33.33 | 255.255.240.0 | | 1500 | | up |

Entity name : iqn.2001-08.com.wiebetech:rtx-ir-000a403d5

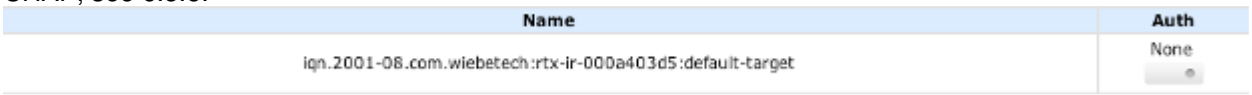
*Some information is obscured for security reasons*

- Name: LAN1/LAN2. LAN1 corresponds to the port labeled CH-1 on the back of the RTX-IR, while LAN2 corresponds to the port labeled CH-2.
- DHCP: Yes/No – Click on the button below "Yes" or "No" to configure the IP settings for each data port. Refer to section _____ for more information.
- IP address: Displays the IP address currently in use by each data port.
- Netmask: Displays the subnet mask being used by each data port.
- Gateway: Displays the IP gateway (in a DHCP network, the IP of the router)
- MTU (Maximum Transmission Unit): Displays the MTU size being used by each data port. The range of MTUs allowed are 1500, 2000, and 3900. Default is 1500. To change the MTU, click the button below the current MTU number of the LAN port that you wish to alter. This will bring up a screen with a dropdown box that can be used to change the MTU.

  Note: Changing the MTU will cause the RTX-IR to function improperly if the switch and network card are not configured appropriately.
- MAC address: Displays the MAC address of each data port.
- Link: Up/Down – Displays the status of each data port. If an Ethernet cable is connecting the RTX-IR to a network or computer, the Link will display "up."

### 6.5.3 Node

The Node option displays the RTX-IR's entity name, which will be seen by the iSCSI initiator, and allows you to toggle CHAP (Challenge Handshake Authorization Protocol) on or off. For more information on CHAP, see 6.5.5.




CHAP is disabled by default. To turn on CHAP, click the button in the Auth column. This will bring up a screen with a dropdown box. Click the dropdown box and select CHAP, then click the Confirm button.

After turning on CHAP authentication, you must set up at least one CHAP account (see section 6.5.5).

### 6.5.4 Session

The session function allows you to view information on a session initiated by an iSCSI initiator application (see Chapter 7.)

### 6.5.5 CHAP account

CHAP is a common iSCSI authentication method. When CHAP is enabled, the RTX-IR will require authentication at login through the iSCSI initiator (see Chapter 7). Authentication also occurs at various times during the connection, by way of transferring the user name, initiator password (also called initiator secret), and target password (also called target secret). RTX-IR uses the same value for initiator secret and target secret. For added security, the authentication information is hashed and a token is sent instead of the information itself.

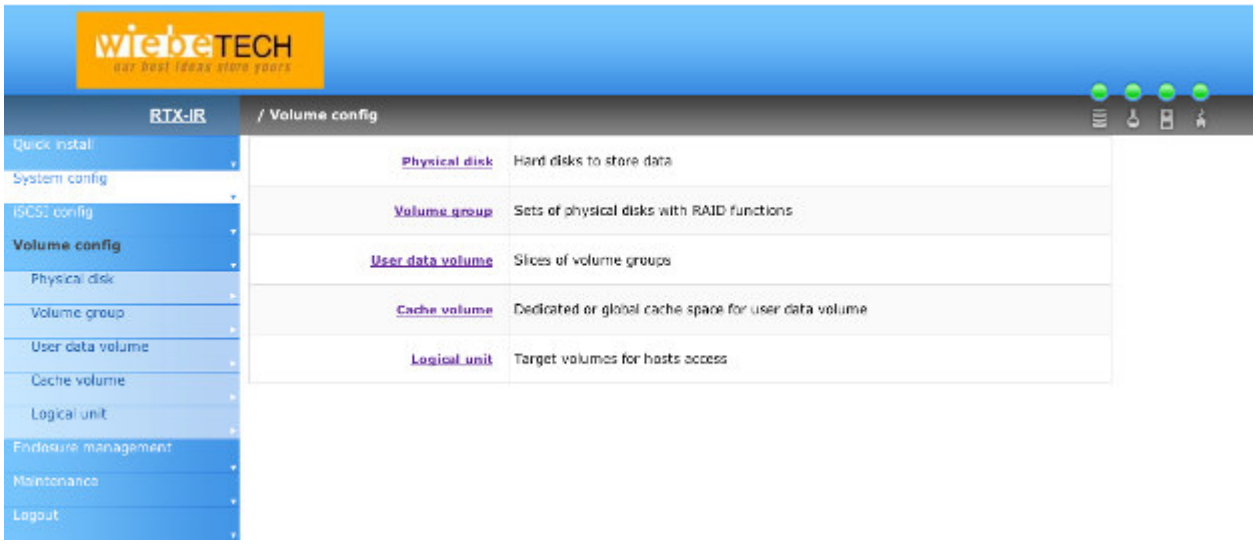
To use CHAP, you will need to turn on CHAP authentication (see section 6.5.3) and then set up a CHAP account. After clicking on the CHAP account option, you will see the following screen:

Click Create to create a new user. This brings up a screen with fields for User, Secret, and Confirm. Enter a user name in the first field, and a 12-16 character password to use as the secret in the second and third fields. Click the Confirm button.

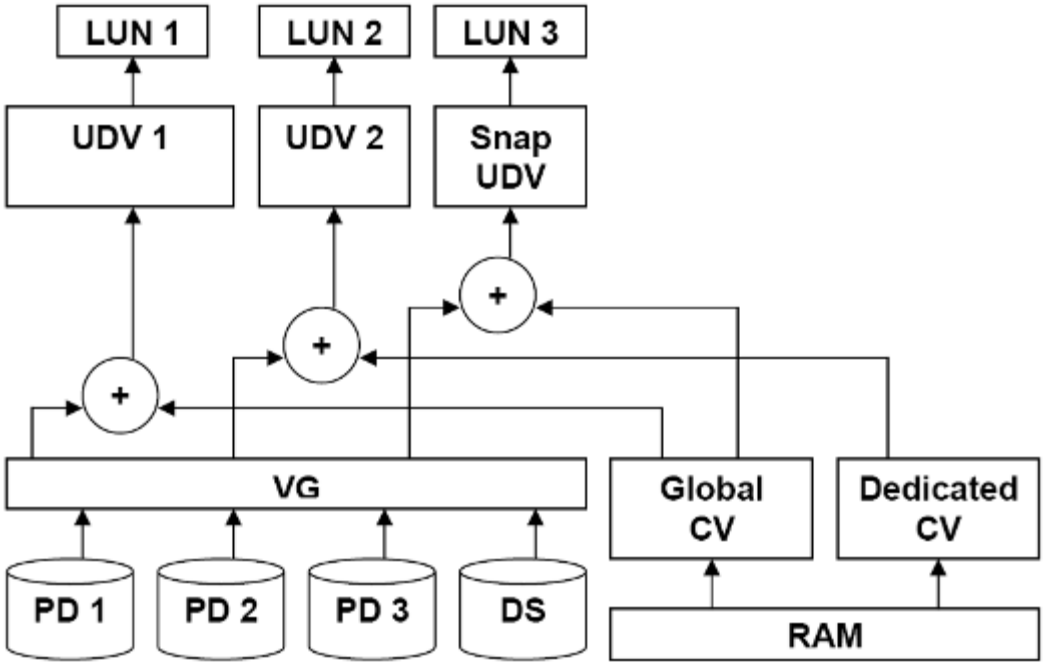
The new CHAP account will appear on the main CHAP account screen:

## 6.6 Volume Config

The Volume Config menu provides the options you will use to set up a RAID on the RTX-IR. Click on Volume Config to view the following menu options: Physical Disk, Volume Group, User Data Volume, Cache Volume, and Logical Unit.



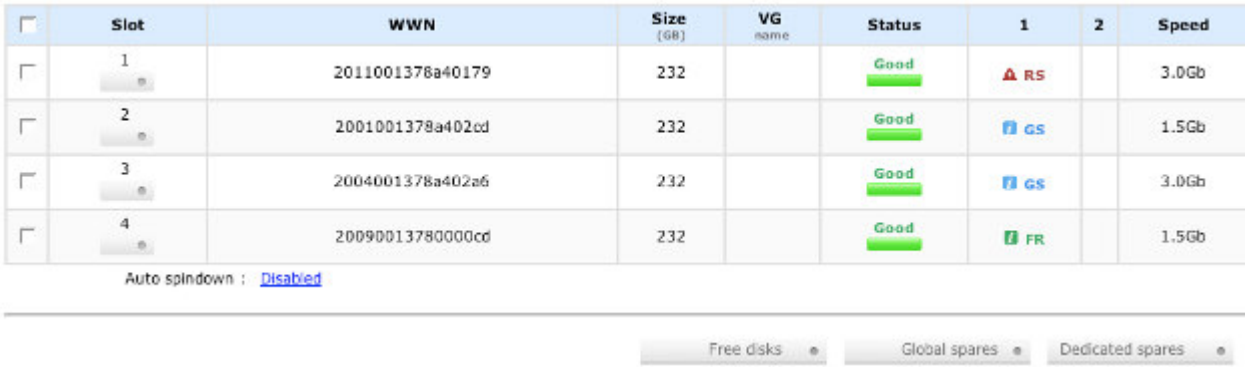
The following diagram explains the architecture of RAID using RTX-IR and the relationship between physical disks (PDs), volume groups (VGs), user data volumes (UDVs), and logical unit numbers (LUNs).




One VG (Volume Group) consists of a set of UDVs (User Data Volume) and owns one RAID level attribute. Each VG can be divided into several UDVs. The UDVs from one VG share the same RAID level, but may have different volume capacity. If multiple UDVs are created, they will mount on your computer as separate partitions. Each UDV will be associated with one specific CV (Cache Volume) to execute data transfers. Each CV could have different cache memory size as defined or configured by user. LUN is a SCSI protocol that the computer uses to distinguish and access SCSI devices.

### 6.6.1 Physical Disk

Click the Physical Disk option to view and modify the status of the drives installed in the RTX-IR.

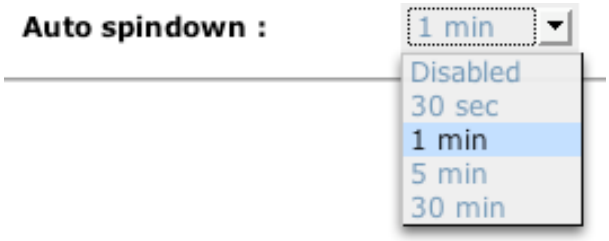



The following information is displayed:

- Checkboxes: Click the checkbox of any disk or disks, then click Free disks, Global spares, or Dedicated spares to set the selected drive(s) to that status. Click the top checkbox to select all drives.
- Slot: The slot number of the hard drive. 1 corresponds to the top bay of the RTX-IR. Click the button below the slot number to display more information about that particular hard drive.
- WWN: The World Wide Name of the hard drive, an identification code unique to each hard drive.
- Size (GB): The logical capacity of the drive.
- VG (name): The Volume group the drive is assigned to, if any.

- Status: Displays general operational status of the disk. Possible states are Good, Defect, and Fail.
- 1: Displays the RAID status of the disk. Possible states are:
  - RD – RAID Disk. The drive is part of a RAID that is currently online.
  - FR – Free disk. The drive is available for use in a volume group, or to be marked as a spare.
  - DS – Dedicated spare. The drive is a dedicated spare of a specific volume group. This option cannot be selected until at least one volume group has been created.
  - GS – Global spare. The drive is a global spare of all VGs.
  - RS – Reserve. The drive contains VG information but cannot be used. This generally indicates that the drive is part of a RAID set that is missing components.
- 2: Displays RAID rebuild status of the disk. Possible states are "R" – Rebuild, or "M" – migration.
- Speed: The maximum speed of the drive. 1.5 Gbps indicates a SATA1 drive, 3.0 Gbps indicates a SATA2 drive, and unknown indicates that the drive does not support either of the two levels.

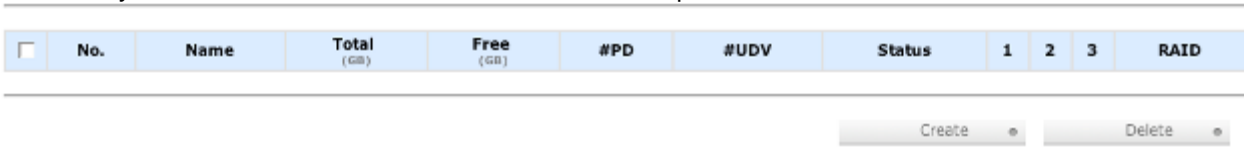
Auto spindown: If auto spindown is enabled, after a set amount of time (30 seconds, 1 minute, 5 minutes, or 30 minutes) of inactivity, RTX-IR will spin down the hard drives to save power. The drives will be spun up again when the RTX-IR is accessed. Auto spindown is disabled by default. To enable auto spindown, click the hyperlink "disabled." On the following screen, select the desired auto spindown time from the dropdown box:




Click the Confirm button.

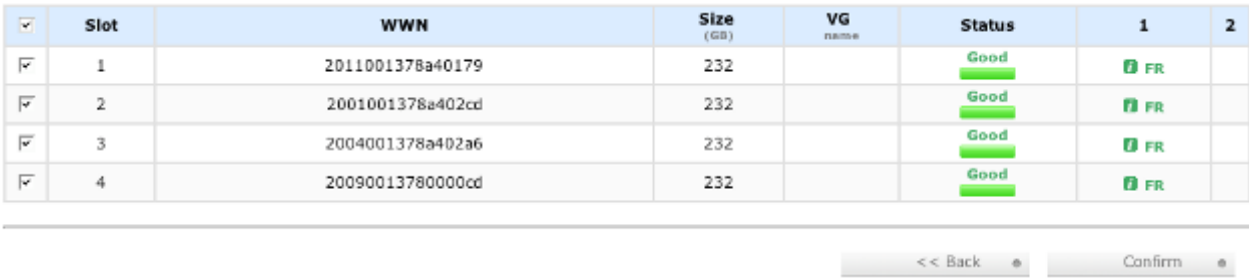
### 6.6.2 Volume Group (VG)

The Volume Group screen displays information about all existing volume groups. To create a usable RAID set, you will first need to create a new Volume Group. Click the Create button.



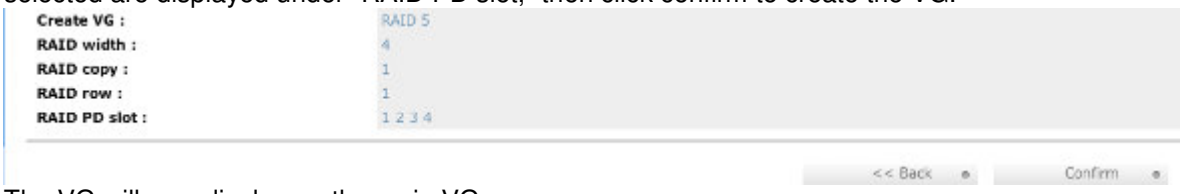

This brings up the VG creation screen. Enter a name for the new VG in the first field, then select your desired RAID type from the dropdown box. WiebeTech recommends RAID5 for maximum performance, capacity, and security. For more information on RAID, see Chapter 1: Introduction to RAID. Click Select PD to select the drives that will be added to the VG. Note: Drives must be marked as Free Disks (FR) before they can be added to a VG. To set drives to Free Disks, see section 6.6.1.

All available Free disks will be displayed. Check the drives that you wish to add to the VG, then click Confirm.

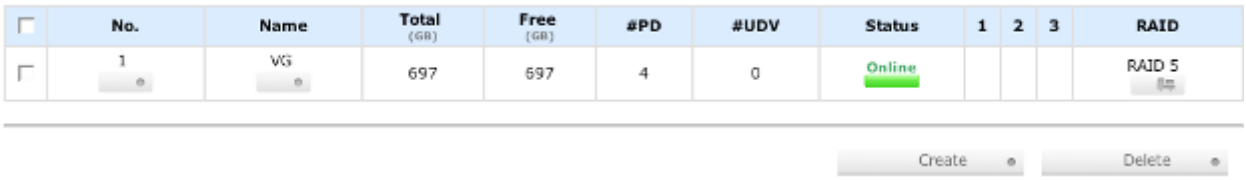



The selected PDs will now be displayed in the VG creation screen. Click next to proceed.

This brings you to a confirmation screen. Verify that the RAID level is correct and all of the disks you selected are displayed under "RAID PD slot," then click confirm to create the VG.




The VG will now display on the main VG screen.




The VG screen displays the following information:

- No: The VG number. Click the button underneath the number of a VG to view more information.
- Name: The name of the VG. Click the button below a VG's name to rename the VG.
- Total (GB): The total capacity of the VG. Note: This will depend on both the number and capacity of the drives that are part of the VG, and the RAID type of the VG.
- Free (GB): The free capacity of the VG (not yet assigned to a UDV).
- #PD: The number of drives in the VG.
- #UDV: The number of UDVs that have been created as part of the VG.
- Status: The status of the VG. Possible states are Online and Fail.
- 1: Displays "DG" if the VG is degraded. This generally means a hard drive is missing or has failed.
- 2: Displays "R" if the VG is rebuilding.
- 3: Displays "M" if the VG is under migration.
- RAID: The RAID level of the volume group. The button underneath the RAID setting indicates "migrate," but it is recommended that if you wish to change RAID types or add disks, you simply recreate the VG using the new RAID type as this is generally faster.

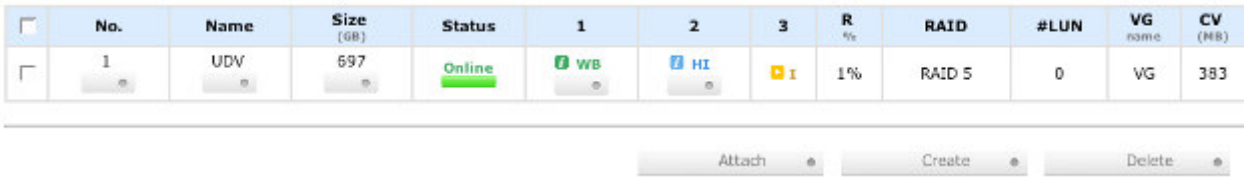
### 6.6.3 User Data Volume (UDV)

The User Data Volume main screen displays any UDVs and allows you to create and delete UDVs.

After a VG has been created, you can create associated UDVs. You must create at least one UDV to access the drives of the RTX-IR with a computer. To begin this process, click Create. This brings up a screen displaying the following:

- Name: Enter a name for the UDV
- VG name: Choose the VG that you wish to add the UDV too.
- CV no.: Cache Volume number – if you have created multiple caches, you can select between them. Normally the default option is preferred.
- Capacity: Enter the capacity of the UDV. The default uses the maximum capacity of the associated VG. If you wish to create multiple UDVs on the selected VG, you will need to reduce the capacity below the maximum so that there is space left on the VG for additional UDVs.
- Stripe height (KB): Determines how the RTX-IR organizes the RAID. Normally the default option is preferred.
- Block size: Determines the minimum file size of the UDV. Higher block sizes can result in more wasted space if many small files are saved to the drive, but are necessary to take advantage of high capacity RAIDs. **If you are creating a UDV over 2 TB in size, you must increase the block size to 4096 to take advantage of the full capacity of the UDV.** For more information, see the Appendix, "Working with Volumes Greater than 2 TB"
- Read/Write: Allows selection of cache type. Normally the default option is preferred.
- Priority: Determines the priority that RTX-IR will give to RAIDing activities (rebuild, initialization) versus priority given to file transfers. High priority will result in slower file transfers during initialization, but provide for faster initialization.

After selecting your desired options, click Confirm. The new UDV will now display on the main UDV screen:



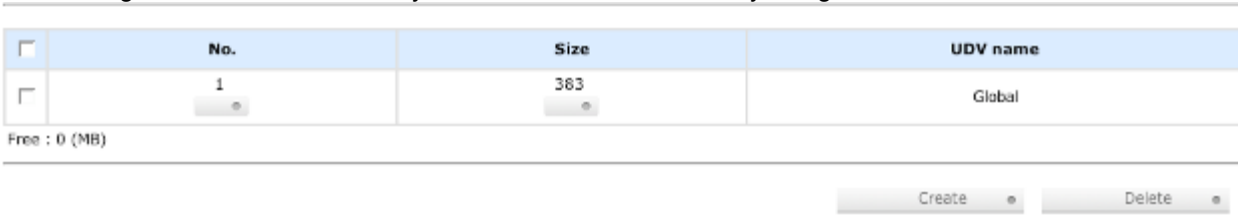

The main UDV screen displays the following information:

- No.: The number of the UDV. Click the button below the number of a UDV to view more information about that UDV.
- Name: The name of the UDV. Click the button below a UDV's name to rename it.
- Size: The total capacity of the UDV. Click the button below the displayed size of a UDV to add capacity to the UDV. Note: There must available space on the VG to extend the UDV.
- Status: The status of the UDV. Possible states are Online and Fail.
- 1: Displays the cache mode of the UDV. "WT" indicates that the cache is set to write through, while "WB" indicates write back mode. Click the button below the cache mode to change the cache mode.
- 2: Displays the priority of RAID functions for the UDV. Possible states are HI, MD (medium), and LO. Click the button below a UDV's priority to change the priority.

- 3: Displays the RAID activity of the UDV. "I" indicates that the UDV is initializing a RAID, "R" indicates that the UDV is rebuilding a RAID, and "M" indicates that the UDV is under migration between RAID types.
- R %: Displays progress of the activity indicated in column "3." Note: Initializing a RAID5 may take several hours.
- RAID: The RAID level of the UDV. This was chosen during the VG creation.
- #LUN: Number of LUNs that the UDV is using. 1 LUN must be attached before use with a computer. See section 6.6.5 for more information on attaching a LUN.
- VG name: The name of the VG associated with the UDV.
- CV (MB): The cache volume of the UDV.

### 6.6.4 Cache Volume

The Cache volume screen allows the creation and management of multiple caches. By default, a global cache using all of the cache memory is created and automatically assigned to all UDVs created.




The cache volume screen displays the following information:

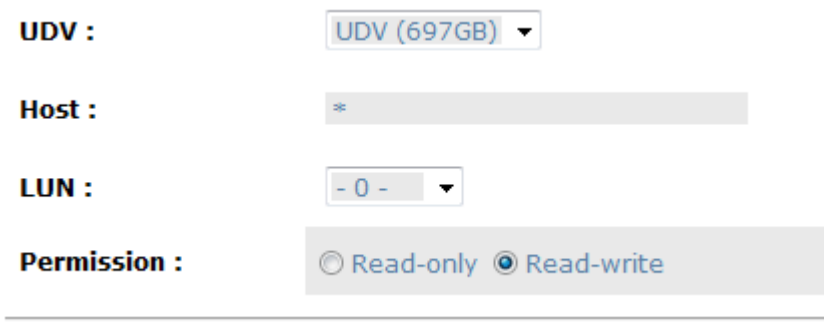
- No.: The number of the cache. Global cache is always first. Click the button below to view more information.
- Size: The size of the cache. By default, the global cache uses all available cache space. If you wish to create additional caches, you must click on the button below the size of the global cache and enter a number lower than the maximum value, then click Confirm. This frees up space to create a new cache. Now click Create, enter the desired size of the new cache, and click Confirm. The new cache will now be an option under "CV No." when creating a new UDV.
- UDV name: The name of the UDV associated with the cache. Global is default for all UDVs.

### 6.6.5 Logical Unit

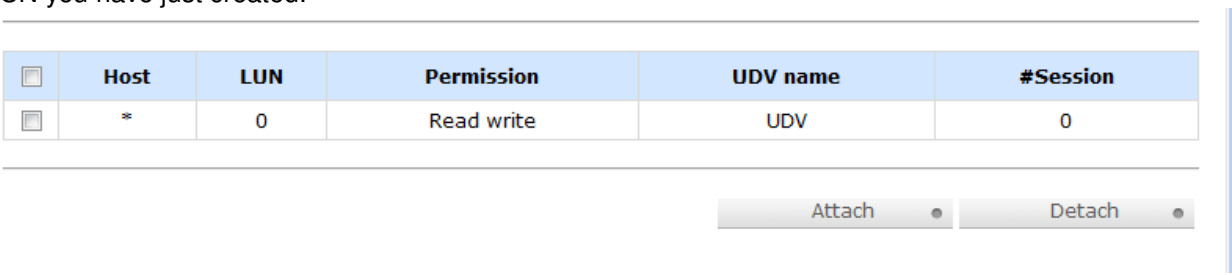
The Logical Unit is what your computer will use to access and manage SCSI devices. In order to access a UDV, you will need to attach a Logical Unit Number (LUN) to that UDV. To attach a LUN, click the Attach button:

The following options are available:

- UDV: Choose the UDV to which you wish to attach a LUN.
- Host: The Host field is filled with an asterisk by default, meaning that any host can access the UDV. You may change the field if you wish to limit access to specific hosts.
- LUN: The LUN field allows you to select which LUN to attach to the UDV. The default option is normally acceptable.
- Permission: Choose Read-write or Read-only for accessing the UDV.




Click Confirm after selecting your desired settings. The main Logical Unit Screen will now display the LUN you have just created:



| | Host | LUN | Permission | UDV name | #Session |
|---|---|---|---|---|---|
| | * | 0 | Read write | UDV | 0 |

Attach Detach

## 6.7 Enclosure Management

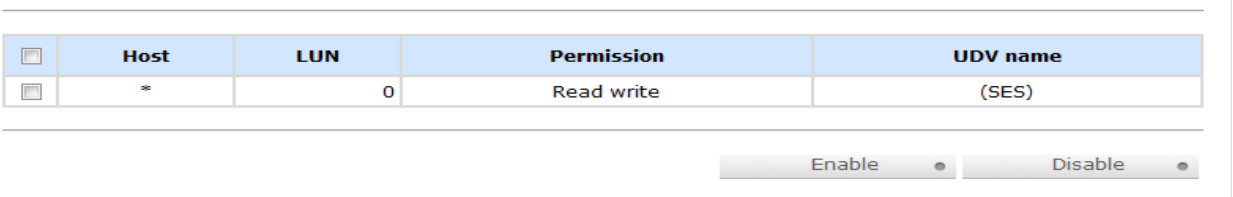
Enclosure management gives access to the following menu options: SES config, Hardware Monitor and SMART.

| | |
|---|---|
| SES config | Access control for SES management |
| Hardware monitor | System monitored voltage, temperature and battery backup module |
| S.M.A.R.T. | Self-monitoring analysis and reporting technology for physical disks |
| UPS | Uninterruptible power supply |

### 6.7.1 SES Config

SCSI Enclosure Services, or SES, is a command set that is used to manage and sense the state of the power supplies, cooling devices, displays, indicators, and individual drives of a SCSI device. The RTX-IR is an SES compliant enclosure, however, in order to use manage RTX-IR using SES you must have the appropriate software installed on your computer. An example is SMART Monitor, offered by Santools at www.santools.com.

To enable SES on your RTX, you must have a UDV set up and a LUN attached. Once you have done this, navigate to SES Config and simply click the Enable button, then click Confirm. The SES-enabled LUN will show up on the main SES screen.



| | Host | LUN | Permission | UDV name |
|---|---|---|---|---|
| | * | 0 | Read write | (SES) |

Enable Disable

### 6.7.2 Hardware Monitor

The Hardware Monitor displays information about the voltages and temperatures of the RTX-IR.

| Item | Information |
|---|---|
| +1.35V: | +1.36 V (min = +1.28 V, max = +1.47 V) |
| +3.3V: | +3.41 V (min = +3.03 V, max = +3.63 V) |
| +5V: | +5.14 V (min = +4.50 V, max = +5.50 V) |
| +12V: | +12.23 V (min = +10.80 V, max = +13.20 V) |
| +2.5V: | +2.59 V (min = +2.35 V, max = +2.85 V) |
| Core Processor: | +49.0 (C) (hyst = +0.0 (C), high = +70.0 (C)) |
| Location 1: | +40.5 (C) (hyst = +0.0 (C), high = +65.0 (C)) |
| Location 2: | +39.0 (C) (hyst = +0.0 (C), high = +65.0 (C)) |

Auto shutdown : ☑

Confirm

Auto shutdown feature: When this checkbox is enabled, the RTX-IR will automatically shut down if any of the voltages or temperatures displayed stray outside of the minimum or maximum values. Auto shutdown is enabled by default to protect the hardware of the RTX-IR.

### 6.7.3 S.M.A.R.T.

S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) is a diagnostic tool for hard drives that gives advanced warning in some cases of hard drive failure. S.M.A.R.T. measures various attributes of a hard drive at all times to detect if certain values have moved outside of a certain range. The S.M.A.R.T. option allows you to view the S.M.A.R.T. status of all of your hard drives.

| Slot | Read error rate | Spin up time | Reallocated sector count | Seek error rate | Spin up retries | Calibration retries | Temperature (C) | Status |
|---|---|---|---|---|---|---|---|---|
| 1 | 100(16) | 116(24) | 100(5) | 100(67) | 100(60) | | 26 | Good |
| 2 | 100(16) | 121(24) | 100(5) | 100(67) | 100(60) | | 26 | Good |
| 3 | 100(16) | 134(24) | 100(5) | 100(67) | 100(60) | | 26 | Good |
| 4 | 100(60) | 122(24) | 100(5) | 100(67) | 100(60) | | 27 | Good |

## 6.8 Maintenance

The maintenance screen gives access to the firmware and configuration functions: Upgrade, Info, Reset to default, Config import & export, and Shutdown.

/ Maintenance

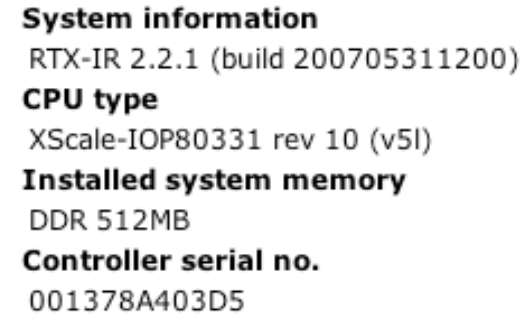
| | |
|---|---|
| Upgrade | Remote upload firmware |
| Info | System information |
| Reset to default | Reset to factory default |
| Config import & export | Import/export configurations |
| Shutdown | Reboot or shutdown system |

### 6.8.1 Upgrade

The upgrade function allows you to upgrade the firmware of the RTX-IR. DO NOT USE THIS FUNCTION WITHOUT SPECIFIC INSTRUCTION FROM WIEBETECH TECHNICAL SUPPORT. Doing so could result in malfunction of your RTX-IR.

### 6.8.2 Info

Click on Info to display system information:




### 6.8.3 Reset to default

The Reset to Default option allows you to restore settings to the factory defaults. After clicking Reset to Default, you will need to click Confirm to verify.

### 6.8.4 Config Import & Export

The config import & export function allows you to import or export a firmware config file. DO NOT USE THIS FUNCTION WITHOUT SPECIFIC INSTRUCTION FROM WIEBETECH TECHNICAL SUPPORT.

### 6.8.5 Shutdown

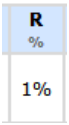
The Shutdown feature allows you to shutdown or reboot the RTX-IR's RAID controller and LCD controller. Note: Choosing Shutdown will not shut down the physical components of the RTX-IR (fans, drives, power supply). However, it will flush data from the cache to the physical drives, which is recommended before physically shutting down using the power switch on the unit to prevent data corruption.

## 6.9 Quick Set-up of RAID

Follow these instructions to quickly create a RAID set using the GUI:

**a.** Click on **Volume Config**, then **Volume Group**.
**b.** Choose **Create**. Select the RAID level you would like to use (usually **RAID 5**). If there is an error saying "Disk is not enough" you'll need to go to **Physical Disk**, select all of the disks you wish to include in the Volume Group, and press the **Free Disk** button.
**c.** Click on **Select PD**. Select all the hard drives you wish to put into the new RAID.* Click **Next** to confirm your choice.
**d.** Next, go to **User Data Volume** (UDV) and choose **Create**. Select the capacity you want for this UDV. (See note at right.)
**e.** The rest of the details can be left at the default setting. You'll need to confirm several times.

NOTE: If the total capacity of your volume exceeds 2TB, it is likely you will encounter problems using that volume on most current operating systems. If that is the case, you will most likely wish to divide the capacity into two or more volumes of less than 2TB each. Please see the section labeled, "Working with volumes > 2TB."




**f.** You should wind up back at the main UDV screen. The RAID will begin initializing, and progress will be displayed in the R% column. Depending on the RAID type and size, the initialization could take several hours. The R% number will disappear when the initialization has finished. Note: If you selected RAID 0, you may not see a progress meter because it initializes almost instantaneously.
**g.** Select the check box next to the UDV you just created and then click **Attach**. If you created more than one volume, you'll need to repeat this step for each one.
**h.** Use the default settings on the next screen. You'll need to confirm your selections.

* With the RTX400-IR, the number of drives contained in the RAID group can be as high as eight using the four eSATA expansion ports on the rear of the unit. These ports allow you to connect another 4-bay JBOD eSATA enclosure (e.g. RTX400-SJ), or multiple 1-bay eSATA drive enclosures and add those additional drives to the RTX400-IR's RAID. Note: These additional drives must be added at the time the RAID is first created.

# Chapter 7: Access the RTX using iSCSI Initiator software

The process for using initiator software to access your RTX varies depending on the software used. Read the documentation accompanying the software for details. However, the general steps are as follows:
**a.** Launch the Initiator application
**b.** Type in the IP address of the Giga LAN connection on the RTX (determined in step 6). This will be a different IP address than the one used to access the GUI.
**c.** The RTX volume will mount to your computer and appear as an internal SCSI drive. Newly-created volumes will need to be formatted before they can be used. If you purchased the RTX with drives preinstalled by WiebeTech, the volume(s) will already have been created and formatted appropriately for your computer.

Below are additional instructions for two common iSCSI Initiator utilities:

**Microsoft iSCSI Initiator for Windows**
After you launch the initiator you'll see a window with several tabs, with the "General" tab opened by default. Select the "Discovery" tab. Under Target Portals, click the "Add" button and enter the IP address for the RTX's Giga LAN port. Next, select the "Targets" tab. You should see a selection for the RTX-IR in this Targets tab. Select that target and click "Log on." All the default settings are fine so just click OK. If the log-on is successful you'll now be able to use the RTX-IR just like any other disk attached to your computer.

**Global SAN iSCSI Initiator for Mac OS**
After you launch the initiator you'll see a window with several tabs, with the "Portals" tab opened by default. Press the add button ("+") and enter the IP address for the RTX's Giga LAN port. Click OK. Next, select the "Targets" tab. You should see a selection for the RTX-IR in this Targets tab. Select that target and click "Log on." All the default settings are fine so just click "OK" or "Connect". If the log-on is successful you'll now be able to use the RTX-IR just like any other disk attached to your computer.

# Chapter 8: Formatting new volume(s)

If you did not purchase the RTX with preconfigured drives, you will need to format the new volume(s) before using them. This is typically done using tools built in to your computer's operating system. (For example, Disk Utility for Mac OS X or Disk Management for Windows.) Consult your computer's operating manual for details.

NOTE: When formatting a volume larger than 2TB in Windows Vista, you may be prompted to select either MBR or GPT for initialization. MBR will truncate the volumes to 2TB each, creating multiple partitions if necessary. GPT will allow volumes over 2TB, but is not compatible with all previous versions of Windows.

## Usage with Macintosh computers

### Mounting and Ejecting Volumes

When you connect the unit to the Mac for the first time and turn on the power, you'll probably see a message saying that the disk is unreadable. This is because you must format the volume before using it. The easiest way to do this is to use Mac OS X's Disk Utility. If you plan to use the unit on both Macs and PCs, select "MS DOS File System" as the format type. If you only plan to use the unit on Macs, then select "Mac OS Extended". After the volume is formatted, an icon representing the drive volume will appear ("mount") on the desktop. You can now use the volume just like an internal hard drive.

Eject the volume before powering down the unit by dragging the volume's icon to the trash bin, or by selecting the volume then pressing Command-E. Shutting down the unit without first ejecting the volume can result in data loss.

## Usage with Windows computers

### Formatting Volumes

Before you can use your RTX-IR, you must first format the drives into a volume. Use Disk Management, which you can find by right-clicking on My Computer then selecting Manage. Select NTFS for the format type.

After the volume is formatted, an icon representing the drive volume will appear in My Computer. You can now use the volume just like an internal hard drive.

### Ejecting Volumes

Unlike external storage devices that connect via FireWire or USB, SCSI devices cannot usually be ejected. It is possible to disable the device using Device Manager. Whether or not you choose to disable the device in this way, always make sure the drives are not being accessed before shutting off the RTX-IR. If the unit is turned off in the middle of a data input/output process, data loss may result.

# Appendix A. Certification list

**RAM**

**(**RAM Spec: 184pins, DDR333(PC2700), Reg.(register) or UB(unbuffer), ECC or Non-ECC.)

| Vendor | Model |
|---|---|
| Unigen | UG732D6688KN-DH, 256MB DDR333 (UB) |
| Unigen | UG732D7588KZ-DH, 256MB DDR333 (Reg, ECC) |
| Unigen | UG764D7588KZ-DH, 512MB DDR333 (Reg, ECC) |
| Unigen | UG7128D7588LZ-DH, 1GB DDR333 (Reg, ECC) |
| Unigen | UG732D6688KS-DH, 256MB DDR333 (UB) |
| Unigen | UG764D6688LS-DH, 512MB DDR333 (UB) |
| Trenscend | 256MB DDR333 (Reg ECC) |
| Trenscend | 512MB DDR333 (Reg ECC) |
| Trenscend | 1GB DDR333 (Reg ECC) |

**iSCSI HBA Card**

| Vendor | Model |
|---|---|
| Adaptec 7211C | (Gigabit, 1 port, TCP/IP offload, iSCSI offload) |
| QLogic QLA4010C | (Gigabit, 1 port, TCP/IP offload, iSCSI offload) |

**NIC**

| Vendor | Model |
|---|---|
| Intel PWLA8490MT | (Gigabit, 1 port, TCP/IP offload) |
| Intel PWLA8492MT | (Gigabit, 2 port, TCP/IP offload) |
| Intel PWLA8494MT | (Gigabit, 4 port, TCP/IP offload) |

**SATA Hard Drive**

| Vendor | Model |
|---|---|
| Hitachi Deskstar | 7K250, HDS722580VLSA80, 80GB, 7200RPM, SATA, 8M |
| Hitachi Deskstar | 7K80, HDS728080PLA380, 80GB, 7200RPM, SATA-II, 8M |
| Hitachi Deskstar | 7K500, HDS725050KLA360, 500G, 7200RPM, SATA-II, 16M |
| Hitachi Deskstar | 7K80, HDS728040PLA320, 40G, 7200RPM, SATA-II, 2M |
| Maxtor | DiamondMax Plus 9, 6Y080M0, 80G, 7200RPM, SATA, 8M |
| Maxtor | DiamondMax 11, 6H500F0, 500G, 7200RPM, SATA 3.0Gb/s, 16M |
| Samsung | SpinPoint P80, HDSASP0812C, 80GB, 7200RPM, SATA, 8M |
| Seagate | Barracuda 7200.7, ST380013AS, 80G, 7200RPM, SATA, 8M |
| Seagate | Barracuda 7200.7, ST380817AS, 80G, 7200RPM, SATA, 8M, NCQ |
| Seagate | Barracuda 7200.8, ST3400832AS, 400G, 7200RPM, SATA, 8M, NCQ |
| Seagate | Barracuda 7200.9, ST3500641AS, 500G, 7200RPM, SATA-II, 16M |
| Western Digital | Caviar SE, WD800JD, 80GB, 7200RPM, SATA, 8M |
| Western Digital | Caviar SE, WD1600JD, 160GB, 7200RPM, SATA, 8M |
| Western Digital | Raptor, WD360GD, 36.7GB, 10000RPM, SATA, 8M |
| Western Digital | Caviar RE2, WD4000YR, 400GB, 7200RPM, SATA, 16M, NCQ |

# Appendix B. Event notifications

### PD/S.M.A.R.T. Events

| Level | Type | Description |
|---|---|---|
| **Info** | Disk inserted | Info: Disk <slot> is inserted. |
| **Info** | Disk removed | Info: Disk <slot> is removed. |
| **Warning** | S.M.A.R.T. threshold exceed condition | Warning: S.M.A.R.T. threshold condition exceeded. |

### Physical HW Events

| Level | Type | Description |
|---|---|---|
| **Warning** | ECC error | Warning: Single-bit ECC error is detected. |
| **Error** | ECC error | Error: Multi-bit ECC error is detected. |
| **Info** | ECC DIMM Installed | Info: ECC Memory is installed. |
| **Info** | Non-ECC installed | Info: Non-ECC Memory is installed. |
| **Error** | Host chip failure | Error: Host channel chip failed. |
| **Error** | Drive chip failure | Error: Drive channel chip failed. |
| **Warning** | Ethernet port failure | Warning: GUI Ethernet port failed. |

### HDD IO Events

| Level | Type | Description |
|---|---|---|
| **Warning** | Disk error | Error: Disk <slot> read block error. |
| **Warning** | Disk error | Error: Disk <slot> writes block error. |
| **Warning** | HDD failure | Error: Disk <slot> is failed. |
| **Warning** | Channel error | Error: Disk <slot> IO incomplete. |

### SES Events

| Level | Type | Description |
|---|---|---|
| **Info** | SES load conf. OK | Info: SES configuration has been loaded. |
| **Warning** | SES Load Conf. Failure | Error: Failed to load SES configuration. The SES device is disabled. |
| **Info** | SES is disabled | Info: The SES device is disabled. |
| **Info** | SES is enabled | Info: The SES device is enabled |

### Environmental Events

| Level | Type | Description |
|---|---|---|
| **Info** | Admin Login OK | Info: Admin login successfully. |
| **Warning** | Admin Login Fail | Warning: Admin failed to login. |
| **Info** | Admin Logout OK | Info: Admin logout successfully. |
| **Warning** | Admin Logout Fail | Warning: Admin failed to logout. |
| **Error** | Thermal critical | Error: System Overheated! The system will auto shutdown immediately. |
| **Warning** | Thermal warning | Warning: System temperature is high. |
| **Error** | Voltage critical | Error: System voltages failed! The system will auto shutdown immediately. |
| **Warning** | Voltage warning | Warning: System voltage is slightly high/low. |
| **Info** | PSU restore | Info: Power <number> has been restored. |
| **Error** | PSU Fail | Error: Power <number> has failed. |

| | | |
|---|---|---|
| **Info** | Fan restore | Info: Fan <number> has been restored. |
| **Error** | Fan Fail | Error: Fan <number> has failed. |
| **Error** | Fan non-exist | Error: System cooling fan is not installed. |
| **Error** | AC Loss | Error: AC loss for the system has been detected. |
| **Info** | Mgmt Lan Port Active | Info: Management LAN Port is active. |
| **Warning** | Mgmt Lan Port Failed | Warning: Failed to manage the system via the LAN Port. |
| **Info** | RTC Device OK | Info: RTC device is active. |
| **Warning** | RTC Access Failed | Warning: Fail to access RTC device |
| **Info** | Reset Password | Info: Reset Admin Password to default. |
| **Info** | Reset IP | Info: Reset network settings set to default. |

**System Config Events**

| Level | Type | Description |
|---|---|---|
| **Info** | Sys Config. Defaults Restored | Info: Default system configurations restored. |
| **Info** | Sys NVRAM OK | Info: The system NVRAM is active. |
| **Error** | Sys NVRAM IO Failed | Error: Can't access the system NVRAM. |
| **Warning** | Sys NVRAM is full | Warning: The system NVRAM is full. |

**System Maintenance Events**

| Level | Type | Description |
|---|---|---|
| **Info** | Firmware Upgraded | Info: System firmware has been upgraded |
| **Error** | Firmware Upgraded Failed | Error: System firmware upgrade failed. |
| **Info** | System reboot | Info: System has been rebooted |
| **Info** | System shutdown | Info: System has been shutdown. |
| **Info** | System Init OK | Info: System has been initialized OK. |
| **Error** | System Init Failed | Error: System could be initialized in the last boot up. |

**LVM Events**

| Level | Type | Description |
|---|---|---|
| **Info** | VG Created OK | Info: VG <name> has been created. |
| **Warning** | VG Created Fail | Warning: Failed to create VG <name>. |
| **Info** | VG Deleted | Info: VG <name> has been deleted. |
| **Info** | UDV Created OK | Info: UDV <name> has been created. |
| **Warning** | UDV Created Fail | Warning: Failed to create UDV <name>. |
| **Info** | UDV Deleted | Info: UDV <name> has been deleted. |
| **Info** | UDV Attached OK | Info: UDV <name> has been LUN-attached. |
| **Warning** | UDV Attached Fail | Warning: Failed to attach LUN to UDV <name>. |
| **Info** | UDV Detached OK | Info: UDV <name> has been detached. |
| **Warning** | UDV Detached Fail | Warning: Failed to detach LUN from Bus <number> SCSI_ID <number> LUN <number>. |
| **Info** | UDV_OP Rebuild Started | Info: UDV <name> has started rebuilding. |
| **Info** | UDV_OP Rebuild Finished | Info: UDV <name> has completed rebuilding. |
| **Warning** | UDV_OP Rebuild Fail | Warning: Failed to complete UDV <name> rebuilding. |
| **Info** | UDV_OP Migrate Started | Info: UDV <name> has started migration. |
| **Info** | UDV_OP Migrate Finished | Info: UDV <name> has completed migration. |
| **Warning** | UDV_OP Migrate Failed | Warning: Failed to complete UDV <name> migration. |
| **Warning** | VG Degraded. | Warning: VG <name> is under degraded mode |
| **Warning** | UDV Degraded | Warning: UDV <name> is under degraded mode. |
| **Info** | UDV Init OK | Info: UDV <name> has completed the initialization. |
| **Warning** | UDV_OP Stop Initialization | Warning: Failed to complete UDV <name> |

| | | |
|---|---|---|
| | | initialization. |
| **Warning** | UDV IO Fault | Error: IO failure for stripe number <number> in UDV <name>. |
| **Warning** | VG Failed | Error: Failed to access VG <name>. |
| **Warning** | UDV Failed | Error: Failed to access UDV <name>. |
| **Warning** | Global CV Adjustment Failed | Error: Failed to adjust the size of the global cache. |
| **Info** | Global Cache | Info: The global cache is OK. |
| **Error** | Global CV Creation Failed | Error: Failed to create the global cache. |
| **Info** | UDV Rename | Info: UDV <name> has been renamed as <name>. |
| **Info** | VG Rename | Info: VG <name> has been renamed as <name>. |
| **Info** | Set VG Dedicated Spare Disks | Info: Assigned Disk <slot> to be VG <name> dedicated spare disk. |
| **Info** | Set Global Disks | Info: Assigned Disk <slot> to the Global Spare Disks. |
| **Info** | UDV Read-Only | Info: UDV <name> is a read-only volume. |
| **Info** | WRBK Cache Policy | Info: Used the write-back cache policy for UDV <name>. |
| **Info** | WRTHRU Cache Policy | Info: Used the write-through cache policy for UDV <name>. |
| **Info** | High priority UDV | Info: UDV <name> is set to high priority. |
| **Info** | Mid Priority UDV | Info: UDV <name> is set to mid priority. |
| **Info** | Low Priority UDV | Info: UDV <name> is set to low priority. |

# Appendix C: Working with Volumes over 2TB in size

Although the RTX can create data volumes larger than 2TB, operating systems cannot usually access such volumes. This is because most systems support only 32-bit LBA (Logical Block Addressing).

Newer operating systems (Windows Server 2003, Vista, Mac OS 10.5.x) should be able to use 2TB+ volumes without difficulty. You will simply need to do one of the following two things while creating the UDV (User Data Volume):

- Change the LBA to 64-bit
- Increase the block size to 4096

### Windows

Neither of the options above will work for Windows versions before Server 2003. You will need to make more than one UDV, each less than 2000GB in size. Each UDV also needs a different LUN.

### Mac OS

Although Mac OS 10.4.x supports only 32-bit LBA, increasing the block size to 4096 will allow you to create a 2TB+ volume that is usable by the OS.

### Linux

Versions of Linux vary, but using one of the above methods may allow you to create a 2TB+ volume that your distribution can use.

# Appendix D: Warnings and Notices

- Use only hard drives that are in perfect condition. Avoid using drives that have ever developed bad sectors during previous usage. This could lead to possible device failure or loss of data.
- The RTX supports SATA hard drives of various specifications and different capacities. However, we recommend using drives of the same brand and type for optimal performance. If drives of different capacities are used in a RAID, the capacity of the smallest drive will determine how much of each drive is used. The additional capacity on the larger drives will not be used by the RAID.
- RAID level 0 will allow you to use the full combined capacity of the drives, and offers the best data transfer speeds. However, RAID 0 offers no protection for the data. If one drive fails in a RAID 0, the data on all of the drives is irretrievably lost. Before creating a RAID, investigate the various RAID types and choose the one that is best for your needs.
- Always back up data before switching RAID types. You must reformat your drives afterwards.
- Before starting any type of hardware installation, please ensure that all power switches have been turned off and all power cords have been disconnected to prevent personal injury and damage to the hardware.
- To avoid overheating, RTX should be operated in a well-ventilated area and in such a way that sufficient airflow is maintained across the controller chips.
- Static electricity can damage electronic components such as the exposed circuitry on hard drives. When swapping hard drives in the RTX, take precautions to guard against such damage:
    - Work in a static-free environment
    - Wear a grounded anti-static wrist strap
    - Store uninstalled components in anti-static protective bags
    - Handle the drives by their edges and avoid touching the exposed circuitry

# Appendix E: Frequently Asked Questions (FAQ)

**Q.** I created one volume, but my computer sees two of them. Why?
**A.** There may be two LUNs assigned to that volume. To check this, use the GUI. Navigate to **Volume Config** and then **Logical Unit**. If there are two LUNs for the same volume, click the checkbox for one of them and click on "detach." Note: You may still see two volumes until you restart your computer.

**Q:** I've hooked up the LAN GUI port to my DHCP-enabled network, but the LCD displays an IP address that is not on my network and I cannot connect to the GUI control panel using that IP address in my web browser.
**A:** This may occur if you plugged in the LAN GUI after the RTX has already started up and initialized, or if you previously configured the RTX for a static network or direct connection. The solution is to use the LCD interface to obtain a DHCP address. Press ENT, then use the up or down arrows to scroll to the option **Change IP config**. Press ENT. The screen will say **DHCP**. Press ENT, then press the up arrow to select **Yes**. Press ENT. The RTX will now attempt to acquire a DHCP address. This new address will be displayed on the main screen of the LCD.

**Q.** When I try to log on to the RTX-IR using the IP address under the iSCSI configuration menu nothing happens.
**A.** Sometimes when you first set up the RTX-IR you'll need to reattach the LUN (Logical Unit Number) if it doesn't work the first time.

**Q.** How many computers can connect to one data volume on the iSCSI unit?
**A.** The short answer is one computer to one volume. This is the safest and suggested usage of the RTX-IR. If two people are accessing files on the same volume at the same time there is a very high chance that data corruption will occur. There are a few file systems that can handle different users manipulating the same volume, but they are not supported by Mac OS or Windows. However, if the users connected to the volume have read-only access then corruption will not be an issue.

**Q.** When I make more than one volume I still see all volumes when connecting to the iSCSI IP address. How am I supposed to allow only one person per volume if that's the case?
**A.** When you attach a LUN to a UDV you'll probably notice a "Host" field with an asterisk as the default selection. This means that any iSCSI Initiator will be able to connect to that volume through that UDV. All iSCSI Initiators have a unique name. You can use this name to restrict access to only certain computers. For example, if my initiator is assigned the name iqn.1991-05.com.microsoft:username01.wiebetech.local, if I put that name into the host field when attaching a LUN then only my specific computer will be able to connect to that volume. You can use this to give one person read access and everyone else write access by attaching two LUNs to one UDV.

**Q.** If I connect one computer to the RTX, and then share the files from that computer, can more than one computer access the files? Would the other computers need iSCSI initiators installed on them?
**A.** One computer at a time can directly access the RTX, but files on the RTX can be shared from that computer to other computers. In such a scenario, the computer attached to the RTX acts as a server. Only the server computer requires an iSCSI initiator. The other computers do not need special software. The difference between iSCSI and NAS (Network Attached Storage) is that a NAS does not need a computer to act as a server.

**Q.** I put my computer to sleep, and now it's having trouble reconnecting to the RTX. How can I prevent this?
**A.** To prevent difficulties such as this, follow the shutdown procedures on page 11. It is suggested that you disable automatic sleep on your computer so it does not go into sleep mode without preparing the RTX for disconnection.

# Appendix F: Technical Specifications

| | |
|---|---|
| **Product name/code:** | RTX400-IR, RTX400H-IR, RTX600-IR, RTX600H-IR & RTX800-IR |
| **Raid Levels Supported:** | RAID 0, 1, 0+1, 3, 5, 6 & JBOD |
| **Host Interfaces:** | • Dual Gigabit Ethernet<br>• 4 expandable eSATA ports (RTX400-IR and RTX400H-IR only) |
| **Data Interface Speeds:** | Up to 200MB/s |
| **Drive Types Supported:** | SATA1 and SATA2 hard disk drives |
| **TrayFree™ Technology:** | Yes |
| **Online Auto-Rebuild:** | Yes |
| **Shock Absorbing Bays:** | Yes (RTX400-IR, RTX400H-IR & RTX600H-IR only) |
| **LED Indicators:** | • Alarm Indicator<br>• Power Indicator<br>• Access Indicator |
| **Security:** | Separate key lock for each HDD (RTX400-IR, RTX400H-IR & RTX600H-IR only) |
| **Controller Display:** | LCD screen with yellow backlight/control panel |
| **Operating System Requirements:** | • Windows XP, Vista<br>• Mac OS X 10.2.6 or later<br>• Linux distributions using Kernel version 2.4 or above |
| **Operating Temperature:** | 50 – 85° Fahrenheit (10 – 30° Celsius) |
| **Operating Humidity:** | 5% to 95%, noncondensing |
| **Power Switch:** | 2 position: On / Off |
| **Power Supply:** | • Input: 100-240VAC<br>• Output: 220 Watts |
| **Cooling Fan:** | 8cm Ball Bearing Fan (x2 for RTX600H-IR & RTX800-IR) |
| **Safety Certification:** | CE/FCC |
| **External Material:** | Aluminum alloy case |
| **Shipping Weights:** | • RTX400-IR: 17lbs sans drives, 21lbs with drives<br>• RTX400H-IR: 17lbs sans drives, 21lbs with drives<br>• RTX600-IR: 19lbs sans drives, 25lbs with drives<br>• RTX600H-IR: 22lbs sans drives, 30lbs with drives<br>• RTX800-IR: 23lbs sans drives, 33lbs with drives |
| **Dimensions:** | 177mm W x 270mm D x 274mm H (RTX400-IR, RTX400H-IR and RTX600-IR)<br>177mm W x 270mm D x 361mm H (RTX600H-IR and RTX800-IR) |
| **Warranty:** | 3-year limited warranty. See warranty statement for details and limitations. WiebeTech offers free phone support for 90 days after purchase (1-866-744-8722). After 90 days, email support is available at support@wiebetech.com. |

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**FCC Compliance Statement:** "This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

Tested to comply with FCC standards

FOR HOME OR OFFICE USE

In the event that you experience Radio Frequency Interference, you should take the following steps to resolve the problem:

1) Ensure that your unit is plugged into a grounded electrical outlet.
2) Use a data cable with RFI reducing ferrites on each end.
3) Use a power supply with an RFI reducing ferrite approximately 5 inches from the DC plug.

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If you have any questions or problems, please contact support@wiebetech.com for technical support. If you are interested in purchasing more WiebeTech products, check our website or contact sales@wiebetech.com. We appreciate being able to serve you!